GHOLSON BRIDGE
(Bridge No. 6104)
Spanning the Meherrin River at Virginia State Route 715
Lawrenceville Vicinity
Brunswick County
Virginia

HAER No. VA-111

PHOTOGRAPHS

WRITTEN HISTORICAL AND DESCRIPTIVE DATA

HISTORIC AMERICAN ENGINEERING RECORD
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LOCATION: Virginia State Route 715 over the Meherrin River, Lawrenceville vicinity, Brunswick County, Virginia. USGS Powellton, VA Quadrangle, Universal Transverse Mercator Coordinates: 18.247100.4067020

DATE OF CONSTRUCTION: 1884

BUILDER: Wrought Iron Bridge Company, Canton, Ohio

PRESENT OWNER: Virginia Department of Transportation

SIGNIFICANCE: The Gholson Bridge is a representative example of a pin-connected wrought iron and steel Pratt through truss typical of late nineteenth century factory-manufactured bridges.

PROJECT INFORMATION: The Gholson Bridge was recorded in 1993-1994 by the Cultural Resource Group of Louis Berger & Associates, Inc., Richmond, Virginia, for the Virginia Department of Transportation (VDOT). The recordation was undertaken pursuant to provisions of a Programmatic Memorandum of Agreement (Draft) among the Federal Highway Administration, VDOT, the Virginia SHPO, and the Advisory Council on Historic Preservation concerning management of historic metal truss bridges in Virginia. Project personnel included Richard M. Casella, Architectural Historian; Ingrid Wuebber, Historian; and Bruce Harms, Photographer.

DESCRIPTION

The Gholson Bridge (VDOT Bridge No. 6104) is a two-span, pin-connected wrought iron through truss bridge which carries Virginia State Route 715 in a north-south direction over the Meherrin River, 1.5 miles east of Route 46 in Brunswick County, Virginia.

The river is approximately 60' wide at the bridge, and is spanned by the south truss at a height of about 27'. The north truss spans the floodplain at a height of about 13'. Overall the bridge is 192' in length. The area around the bridge consists of forest and open pastures and scattered farms and residences (Figure 1).

The two trusses are of the Pratt type, with parallel chords, posts in compression, and diagonals in tension. All members of the bridge are wrought iron or steel, joined with pinned, riveted, or threaded connections. Both trusses are 16' high and 14' wide with panels measuring 14'4" long. The south truss is 100'4" with seven panels; the north truss is 86' with six panels (Figure 2). The two trusses are identical in construction except for their length and the dimensions of certain structural members. The description of the bridge members that follows applies to both trusses unless otherwise noted.

Top chords and inclined endposts of the south truss are riveted box sections, 12" x 6-3/8" overall, constructed with 12" x 1/4" top plate, 6" x 1-3/4" side channels with flanges turned out, and 4" bottom stay plates spaced 36" on center. The north truss top chord and endposts are identical in construction to those of the south truss, excepted constructed with 5" x 1-3/4" channels. The north posts of the north truss have been repaired with welded box sections which match the existing posts. Each truss rides on friction-plate bearings and fixed bed-plate bearings. Bottom chords consist of paired die-forged eyebars and vary in size with each truss. The bottom chords at panels one and two are continuous, square, and measure 1-1/8" on the south truss, and 1" on the north truss. The bottom chords at panel three measure 2" x 1" on the south truss, and 1-1/2" x 1" on the north truss. The bottom chords in the center panel of the south truss measure 2-3/8" x 1".

All posts are 5" x 2-3/4" rolled I-beams with the exception of the first post of the south truss which has been increased in section with the addition of continuous 4" x 1/4" plates riveted to the top and bottom flanges.

Main diagonals and counter diagonals both consist of loop-welded eyebars, square, round, or rectangular in section. Adjustable diagonals have standard threads and sleevenuts. The south truss diagonals measure 1-1/8" square in panel two, and 7/8" square in panel three. Panel three has a single 3/4" round counter and the center panel has two opposing counters 7/8" square. The north truss diagonals measure 1" square in panel two, and 3/4" round in panel three. Hip verticals consist of paired die-forged eyebars measuring 2" x 3/4". Bottom chord pins are 2-3/8" and top chord pins are 1-3/4".

The portal strut consists of a lattice-bar girder with a flared bottom flange which drops at a 45 degree angle at its ends to form integral sway bracing and a polygonal portal. The strut is 16" high, flaring to 30" at the ends and built with a rolled 3" T-section top flange, a riveted 3" T-section bottom flange, and 1-1/4" x 1/8" lattice-bar webbing. Upper lateral struts are 5" x 2-3/4" I-beams. Upper lateral bracing consists of 5/8" diameter threaded rods which attach to the strut endplates. There are no intermediate sway braces.

The rolled I-section floor beams measure 10-1/2" x 4-1/8" with 6" x 3/8" reinforcing plates welded to the top and bottom flanges. The girders are suspended from the bottom chord pins at each post by 1" square beam hangers. Six 8" x 5-1/4" I-beam floor stringers, spaced 2' apart on center, rest on the girder. Bottom lateral bracing rods are 7/8" in diameter with threaded ends attached to the ends of the girders with skewback brackets.

The bridge decking consists of 4" x 10" pressure-treated wood planks attached to the stringers with carriage bolts and deck clips. The roadway is 11' wide and edged with 4" x 6" wood curbing raised 4" off the decking with wood blocks spaced approximately 8' on center. The modern bridge railings consist of a single horizonal row of 6" x 3-1/2" channel, 32" off the deck and welded to angle posts.

The trusses rest on U-type abutments and a battered center pier, all constructed of quarry-faced random ashlar sandstone. The abutments have concrete backwalls. The south abutment and the pier are approximately 16' high while the north abutment is about 13' high.

A cast iron builders plaque is mounted on the top of the portal strut at each end of the bridge. The plaque features a pedimented and molded cap flanked by semi-circular consoles and bordered with a half-round molding. The plaque reads:

WROUGHT IRON BRIDGE CO.
BUILDERS
CANTON OHIO

A second cast iron plaque is rectangular, undecorated, and mounted between the flanges of the portal strut directly below the builders plaque. The second plaque reads:

F. E. BUFORD JUDGE
I. E. BRITT
J. R. JONES COMMISSIONERS
H. H. HEARTWELL

HISTORICAL INFORMATION

Background

Brunswick County was crossed by two important Native American pathways, the Occoneechee, or Western Path, and the Tuscarora Path. The Occoneechee Path linked the Catawba in South Carolina, and the Cherokee in North Carolina and Tennessee, with other Native American groups in Virginia. After the fur supply around the tidewater Virginia settlements was exhausted, enterprising men sought trade with Southside Virginia. English explorers penetrated the Brunswick County area beginning in the 1650s (Neale 1975:5, 7-8).

The 1677 Treaty of the Middle Plantation established a buffer zone of friendly, dependent Indians in the area south of the Appomattox and Blackwater rivers, which included Brunswick County. The encroachment by white setters into the buffer zone resulted in the destabilization of the frontier. In response, Virginia's Governor, Alexander Spotswood, established a trading outpost in 1714 which protected both the white settlers and friendly Native American groups in the area, the Meherrin, Sapony, and Nottoway tribes. A unique feature of Fort Christanna was the Native American Indian school run by Charles Griffin who later taught at the Indian School at the College of William and Mary. Fort Christanna was established on a bend of the Meherrin River west of present-day Brunswick County Road 46. It was situated on a tract of land six miles square, or 23,040 acres, which included the site of Gholson Bridge. As soon as the fort was established, land claims began appearing in the surrounding territory (Neale 1975:13, 18).

Government support of Fort Christanna was withdrawn in 1718, but Native American groups continued to occupy the post. The local Sapony people appear to have migrated first to Pennsylvania and then to New York around 1740. Other local groups had already migrated to South Carolina (Neale 1975:30).

In 1730, the tract of land which included the fort and the site of Gholson Bridge was divided between individuals who bad invested in the improvement of the fort property. These men established homesteads and were among the earliest of Brunswick County's permanent settlers. Brunswick County, which had been established in 1720, was a large frontier county which was later subdivided as new centers of local government became necessary. Nine counties, Lunenburg, Meckenburg, Halifax, Pittsylvania, Henry, Patrick, Franklin, Bedford, Campbell, and part of Appomattox and Amelia, and most of Charlotte County, were subsequently carved out of the original territory of Brunswick County (Neale 1975:31, 35).

Patents in the new county of Brunswick were limited to 1,000 acres and abeyance of land taxes was offered as an incentive for settlement. Most of the early patentees took up land along the waterways, the Native American Indian trails, and along the road from Fort Christanna to the settlement at Hicks' Ford (now Emporia) (Neale 1975:43).

In 1906, the Board of Supervisors described one-tenth of Brunswick County's territory as "under cultivation at any one time," a radical drop from the antebellum period when half of the county was under cultivation. Much of the county was covered by pine-oak forest. The major cash crops were tobacco, wheat, corn, cotton, and peanuts. Truck farms, apple and peach orchards, were also present in the county. The Meherrin River formed an agricultural dividing line, with tobacco and wheat predominating north of the river, and cotton and peanuts predominating south of the river (Smithey 1907:16-19).

Because the local rivers were unnavigable, a network of roads was constructed to carry out the trade and commerce of the area. Bridges became a major concern in a county with so many stream and river crossings. The earliest bridges were built across the major rivers, the Nottoway and the Meherrin (Neale 1975:53-54).

Local men built and maintained these early bridges. Colonel Thomas Claiborne was responsible for building some of the county's larger bridges. He built a bridge over the Meherrin River at Thomas Gholson's farm in 1792. The "high bridge clear of high water" was built for £104 and Claiborne agreed to maintain it for £26 a year for four years. This and all subsequent bridges at the site were known as Gholson Bridge (Neale 1975:121).

The Gholson family was associated with the area around Gholsonville, a stage coach stop lying about seven miles south of Lawrenceville in cotton growing country (Smithey 1907:44). The Gholson Bridge area was associated with the eighteenth-century plantation of "Ellerslie," now Brunswick Plantation. Ellerslie, with a reputation for being haunted, was built by the Hartwell family before the Revolutionary War and before the construction of Brunswick County Road 715, known locally as Gholson Bridge Road. (Lee 1966:212). Ellerslie Plantation may have had a glass factory in operation on the premises (Neale 1975:116). Archibald McCrae purchased Ellerslie during World War I. He removed all the structures from the eighteenth-century plantation and created the new plantation of "Brunswick" in its stead (Personal communication, Hank Roehrich, 1994).

Ezell's Mill and its accompanying millkeeper's cottage is also closely associated with the bridge. For fifty years one could have stood on the Gholson Bridge and watched Dr. W.R. Ezell's three-story grist and roller mill in operation (*Brunswick Times-Gazette*, August 1980; Neale 1975:118). Other activities near the bridge included a clay pit operated by the Lawrenceville Brick Company (Personal communication, Gay Neale, 1994).

History of Gholson Bridge

The 1880s and 1890s was a period in which many of the bridges of Brunswick County were repaired or upgraded. The eighteenth-century Gholson Bridge had been rebuilt in 1850 (Neale 1975:121). On February 28, 1882, Samuel Rose was awarded the contract to repair Gholson

Bridge for $175. In November of the following year, three commissioners were appointed to ascertain whether the bridge needed further repairs. They concluded that Gholson Bridge needed to be replaced by a modern iron bridge. The commissioners were given the authority to solicit bids from the Wrought Iron Bridge Company of Canton, Ohio and other manufacturers of iron bridges, to build an iron bridge at the same site of the earlier Gholson bridges with stone abutments and piers. Meanwhile, the commissioners were to arrange to have a ladder attached to the old bridge for foot traffic (Brunswick County Order Book 43:15, 238, 261-262).

In January 1884, the old Gholson Bridge was reported to be down and the new one not yet built. People living on the south side of the Meherrin River petitioned to have a temporary ferry established at the bridge so that they could have access to the county seat at Lawrenceville. However, the commissioners thought it an impractical idea (Brunswick County Order Book 43:271-272, 276).

In March 1884, the Board of Supervisors decided to award the contract for Gholson Bridge to the Wrought Iron Bridge Company of Canton, Ohio. Stewart & Shirreffs, the company's agents in Richmond, Virginia, were awarded the contract to complete the stone work and masonry for the bridge. The bridge's superstructure was to cost $3,680 and the stone pier and abutments $4,890. I.E. Britt was chosen to superintend the bridge's construction for the Board of Supervisors (Brunswick County Order Book 43:292, 295, 298, 320).

Commissioner Britt reported the bridge's stone work was completed by the end of August 1884. The entire construction project was completed by the end of October (Brunswick County Order Book 43:363-364, 384).

Gholson Bridge was repainted and/or had minor repairs made in 1887, 1891, 1892, 1896, 1900, 1902, and 1909 (Brunswick County Board of Supervisor's Record Book 3:280; Brunswick County Order Book 44:324; 46:19, 492; 48:17, 551; 49:369). In 1894, a walkway was built on the north side of the bridge for $26.75 (Brunswick County Order Book 47:123). The bridge appears to have been painted a brown color (Neale 1975:121).

In 1908, high water damaged bridges on the Meherrin River, including Gholson Bridge. R.R. Jones furnished timber for new flooring and sleepers, which was specified to be of solid heart white oak or post oak (Brunswick County Board of Supervisors Record Book 3:74).

During the 1970s and 1980s, the bridge suffered damages from a series of collisions. In December 1974, the north right (looking south) endpost was damaged and the bridge closed for two weeks until repairs were completed. In 1978, the south right endpost was similarly damaged and again the bridge was closed for two weeks until a new endpost could be installed. In 1983, an unspecified endpost was again damaged as well as the portal and repairs were made (VDOT n.d.).

The Gholson Bridge was listed on the Virginia Landmarks Register on November 15, 1977, and on the National Register of Historic Places on May 1, 1978.

Thomas Pratt and the Pratt Truss

Thomas Pratt was born in Boston in 1812, entered Rensselaer Polytechnic Institute at age 14, became an engineer with the United States Army Engineers at 18, and began a professional engineering career with Boston & Maine Railroad at age 21. Pratt worked his entire life in the employ of various New England railroad companies (American Society of Civil Engineers [ASCE] 1876:332-333; Condit 1960:108).

Pratt is famous for a bridge truss that he designed in 1842 that consisted of two parallel chords connected by vertical wood posts in compression and double wrought iron diagonals in tension. Pratt's design was similar in appearance to an earlier truss patented by William Howe, but functioned structurally opposite. The Howe design put the verticals in tension and the diagonals in compression. The Pratt truss is considered to be the first scientifically designed truss, incorporating what are now considered basic structural engineering principles (Condit 1960:109). Pratt used shorter compression members, allowing members of smaller cross section to be used without sacrificing overall strength. This innovation provided a lighter truss requiring less materials, yet offered greater span and load bearing capability than the other truss designs of the time.

In 1844, Pratt was granted a patent for two truss designs, one with parallel chords, and one with a polygonal top chord. The polygonal version reflected Pratt's understanding of the application of mathematical principles in calculating the forces involved and the precise strength of material required to counter those forces. Pratt's patent was renewed in 1858. The use of the Pratt truss for the deck of John Roebling's Niagara River Suspension Bridge in 1855 drew worldwide attention to the design and undoubtedly contributed to its increased use. By 1889, the truss in its iron form ranked first in usage for railroad bridges. Thousands of bridges, both highway and railroad, have been built following the Pratt design or some variation (ASCE 1876:334-335; Condit 1960:111, 112, 302; Cooper 1889:11; Johnson 1929:179).

The Wrought Iron Bridge Company, Canton, Ohio

The Wrought Iron Bridge Company was incorporated in 1871, taking over the operation of a foundry which had operated in Canton, Ohio, since 1840. Among the first officers of the company were David Hammond, President; W.R. Reeves, Superintendent; and Jon Abbott, Engineer and Attorney. The early works of the company were focused on the building of

wrought iron arch bridges following designs patented by Hammond, Reeves and Abbott. By 1881, the firm employed 270 men and had built bridges in twenty-five states (Deibler 1975:47, 48; Wrought Iron Bridge Company 1872:2).

In 1892, a new main riveting shop measuring 256' square was built, which incorporated the latest advances in bridge building methods and machinery. It was the first bridge shop to use electrically operated machinery. The company operated out of offices in New York City and Chicago as well as the main facility in Canton (*Engineering News* 1898:253).

In 1901, the Wrought Iron Bridge Company was purchased by the newly formed American Bridge Company. The American Bridge Company was formed in 1900-1901 by J.P. Morgan as a consolidation of twenty-eight bridge companies, representing eighty percent of the structural steel fabricating capacity of the United States. At that time, the Wrought Iron Bridge Company plant had a manufacturing capacity of 5,000 tons of steel per year, making it one of the smallest of the twenty-eight companies purchased by the American Bridge Company (United States Steel Corporation 1975:7, 15).

According to *A Survey and Photographic Inventory of Metal Truss Bridges in Virginia, 1865-1932*, a study conducted by the VDOT Research Council in 1973, the Wrought Iron Bridge Company built a total of seven metal truss bridges in Virginia including six in the Staunton VDOT Construction District and one in the Richmond District (Deibler 1973). One other bridge, constructed by the Wrought Iron Bridge Company, the Linville Creek Bridge (Virginia Bridge No. 6154) in Rockbridge County, is included in the seventeen historic metal truss bridges recorded by Virginia in 1993-1994, of which this report is a part.

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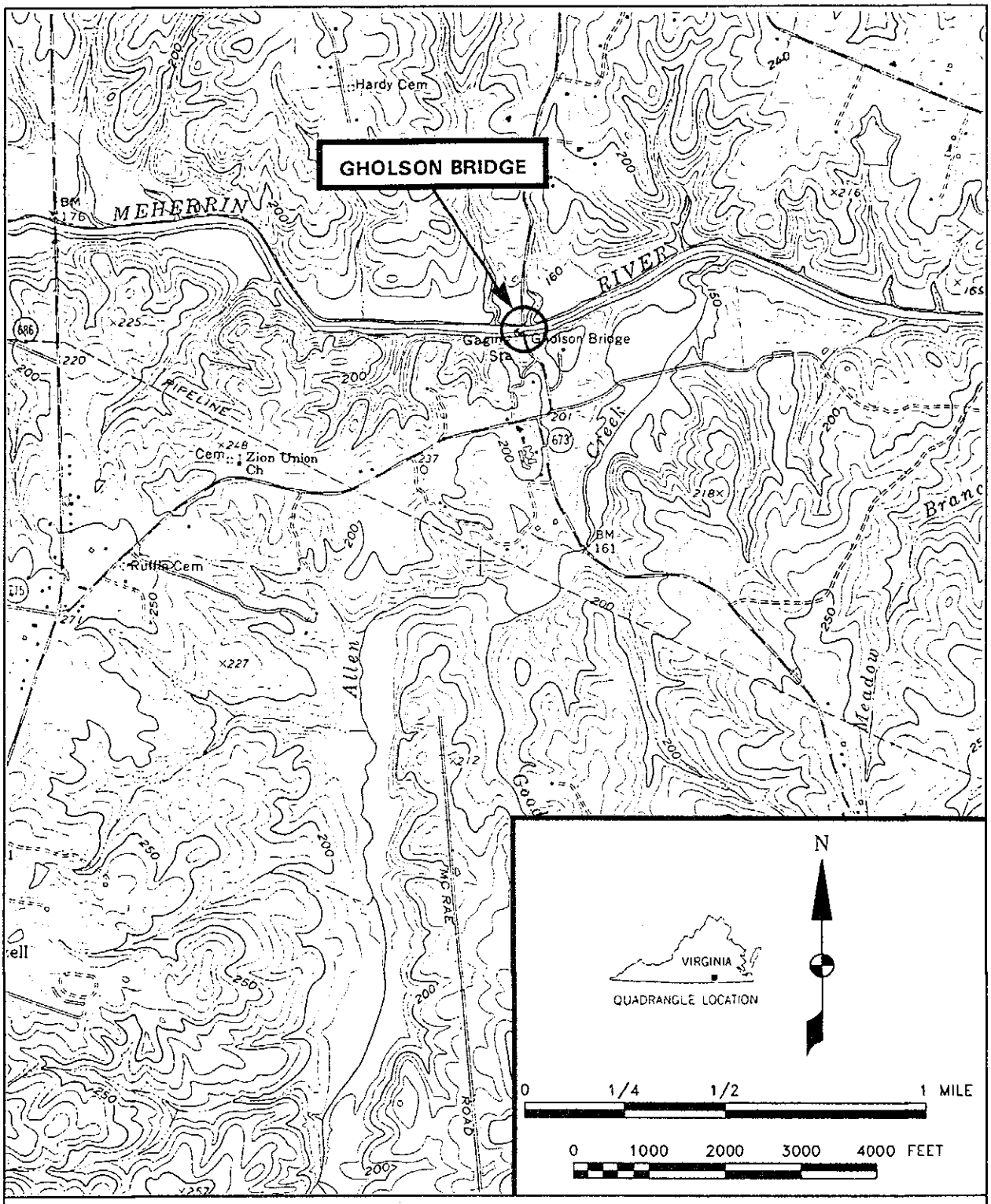

FIGURE 1: Location Map

SOURCE: USGS 7.5 Minute Quadrangle, Powellton, VA, 1963 (Photorevised 1973)

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SOURCE: Virginia Department of Transportation 1971

FIGURE 2: Original Bridge Report, Bridge No. 6104, March 23, 1971